

Laparoscopic adhesiolysis for recurrent small bowel obstruction: long-term follow-up

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Background: Recurrent small bowel obstruction caused by postoperative adhesions has traditionally been treated by conventional laparotomy, but laparoscopic management of acute small bowel obstruction has been reported. The aim of this study was to assess the long-term efficacy and clinical outcome of laparoscopic adhesiolysis for recurrent small bowel obstruction.

Methods: After conservative treatment, elective laparoscopic treatment was attempted in 17 patients hospitalized for recurrent small bowel obstruction after abdominal or pelvic surgery.

Results: Postoperative adhesions were identified laparoscopically in all patients. Laparoscopic treatment was possible in 14 patients (82.4%). Conversion to laparotomy was required for 3 patients (17.6%) because of intestinal perforation (n = 1) or a convoluted mass of adherent bowel (n = 2). Long-term follow-up was possible in 16 patients. Two recurrences of small bowel obstructions were noted over a mean follow-up period of 61.7 months.

Conclusions: Laparoscopic adhesiolysis is a safe and effective treatment for recurrent small bowel obstruction. Conversion to laparotomy should be considered in patients with dense adhesions. (*Gastrointest Endosc* 2001;54:476-9.)

Adhesions after abdominal and pelvic surgery can cause small bowel obstruction and chronic abdominal pain. Laparotomy has classically been used in the treatment of obstruction caused by adhesions. However, there are now reports of the feasibility and safety of laparoscopic adhesiolysis for acute small bowel obstruction.¹⁻⁶ The aim of this study was to assess the feasibility, safety, and clinical outcome of laparoscopic adhesiolysis.

PATIENTS AND METHODS

Seventeen consecutive patients (12 men, 5 women; mean age 49.8 years; range 17 to 70 years; Table 1) with small bowel obstruction caused by adhesions were managed by laparoscopy between 1992 and 1999. All patients had undergone 1 or 2 abdominal operations and had experienced at least 2 episodes of small bowel obstruction (Table 2). Initially the patients were carefully observed during a period of conservative treatment that consisted of measures such as fasting, placement of long intestinal tubes, and the administration of antibiotics as well as intravenous fluids and electrolytes. Observation included serial abdom-

inal radiographs, physical examination, and appropriate laboratory tests. Patients in whom the bowel obstruction resolved within 1 week and who fulfilled the following criteria were treated laparoscopically: at least 2 prior episodes of small obstruction, confirmed improvement in physical signs of peritoneal inflammation, a decrease in white blood cell count to normal levels, and disappearance of air-fluid levels on plain abdominal radiographs.

Fifteen other patients with small bowel obstruction caused by postoperative adhesions were also treated during the study period. These patients did not fulfill the criteria for laparoscopic treatment. Five underwent laparotomy because of small intestinal strangulation (2 patients) or failure to respond to conservative treatment (3). The other 10 patients were hospitalized with an initial episode of small bowel obstruction that resolved with conservative management alone.

Elective laparoscopy was performed with the patient in the supine position under general anesthesia.⁷⁻¹¹ The surgeon stood on the left side of the patient. Videomonitors were placed at the head of the table if the previous operation was in the upper abdomen or at the foot if in the lower abdomen. The abdomen was punctured away from all scars with a Veres needle, and the syringe test was performed to confirm that the tip of the needle was not located in a vessel or intestines as follows: normal saline solution (5 mL) was injected through the Veres needle. If the saline solution entered the peritoneal cavity, it could not be reaspirated. If the saline solution was reaspirated, it signified that the tip of the Veres needle was in a closed cavity or newly formed space. A pneumoperitoneum was established by insufflation of carbon dioxide. The intra-abdominal pressure was monitored. The first trocar was inserted in

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Table 1. Patient characteristics

	Laparoscopy (n = 14)	Conversion to laparotomy (n = 3)
Age	47.7 years (17-70)	53.0 years (50-56)
Gender	11 men, 3 women	1 man, 2 women
No. of previous operations	1.1	1.5
No. of episodes of SBO	2.4 (2-4)	2.5 (2-3)

SBO, Small bowel obstruction.

Table 2. Previous operations

Type of operation	No. of patients
Total gastrectomy	2
Partial gastrectomy	4
Appendectomy	2
Hysterectomy	2
Cholecystectomy	1
Partial gastrectomy and appendectomy	1
Hysterectomy and appendectomy	1
Partial gastrectomy and hysterectomy	1
Unknown	3
Total	17

Table 3. Outcome

	Laparoscopy (n = 14)	Conversion to laparotomy (n = 3)
Mean operative time (min)	105 (73-163)	119 (97-141)
Mean postoperative stay (d)	10.4 (6-17)	18.3 (12-28)
Intraoperative complication rate	3/14 (21.4%)	0/3 (0%)
Postoperative complication rate	0/14 (0%)	0/3 (0%)

an area without adhesions as determined by blind exploration with a 23-gauge needle. The remaining trocars were inserted under direct vision in areas devoid of adhesions. The pathogenic adhesions were identified and lysed with scissors or forceps. To minimize the risk of intestinal injury, electrosurgical current was not used for dissection.¹² In patients with dense adhesions, especially when there was a convoluted mass of adherent bowel, the operation was converted to a laparotomy.

The risks of laparoscopic treatment and the possibility of conversion to laparotomy were explained to all patients before surgery, and written consent was obtained. Follow-up evaluation was performed by review of hospital records and phone contact with the patients.

RESULTS

Laparoscopic treatment was attempted in all 17 patients. The mean number of hospitalizations for small bowel obstruction was 2.9 before entry into the study. All prior episodes resolved with conservative nonsurgical management alone. Adhesions were identified at laparoscopy (Fig. 1). Adhesions between the abdominal wall and small intestines were successfully lysed by using the laparoscopic

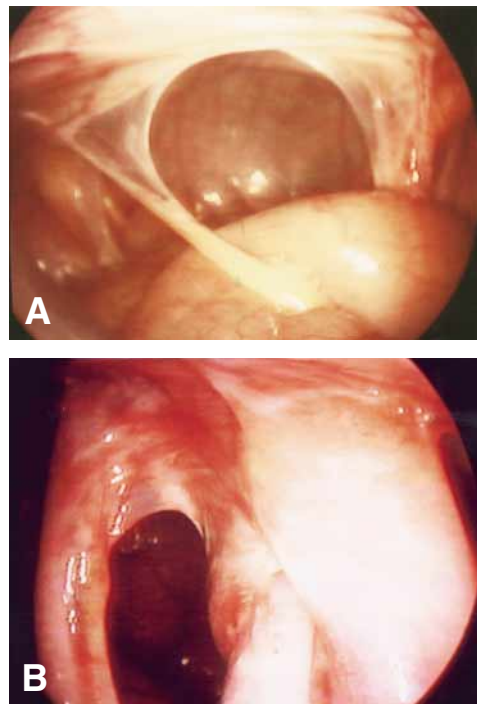


Figure 1. A, Laparoscopic view of single band adhesion. B, Laparoscopic view of convoluted mass of adherent bowel.

approach in 14 of 17 cases (82.4%). Conversion to laparotomy was required in 3 cases (17.6%). In one, a minilaparotomy (3 cm length) was performed for an intestinal perforation caused during adhesiolysis. Conventional laparotomy was required in 2 other patients who had convoluted masses of adherent bowel that would have been impossible to separate with laparoscopic techniques. There were 3 complications: the intestinal perforation in 1 patient and serosal injury in 2 patients. These injuries were successfully repaired by seroserosal suture by using 3-0 VICRYL (Ethicon, Inc., Somerville, N.J.) and forceps under laparoscopy.

In the laparoscopy group, the mean operative time was 105 minutes and mean postoperative hospital stay 10.4 days. For the group of patients in whom laparoscopy was converted to laparotomy, the mean operative time was 119 minutes and mean postoperative hospital stay 18.3 days (Table 3). Follow-up information was available on 16 of 17 patients. Mean follow-up was 61.7 months (11 to 89 months). At last follow-up, 14 patients (87.5%) were asymptomatic.

Recurrent small bowel obstruction developed in 2 patients who had been treated by laparoscopic adhesiolysis. The first was hospitalized 48 months after surgery. The patient improved with nasogastric suction and intravenous administration of fluids and left the hospital the next day. The cause of the obstruction was not established. This patient had no further episodes of small bowel obstructions over

the next 26 months. The other patient had a recurrence of small bowel obstruction at 8 months and 4 times thereafter during the first 3 years after laparoscopic adhesiolysis. This patient underwent laparoscopic adhesiolysis after the fifth such episode. The cause of the recurrent episodes of obstruction appeared to have been incomplete adhesiolysis at the previous operation. The adhesions were completely lysed.

DISCUSSION

Postoperative adhesions are universal after abdominal and pelvic surgery. Menzies and Ellis¹³ found that in 93% of patients who have undergone a previous laparotomy, intra-abdominal adhesions are found at a subsequent surgery. Although adhesions are of little importance in most patients, some may experience clinical consequences such as small bowel obstruction. Several investigators have reported that laparoscopic surgery leads to fewer adhesions compared with laparotomy.^{14,15} Traditionally, laparotomy has been performed for small bowel obstruction caused by adhesions. However, laparoscopy has been used in patients with chronic abdominal pain and acute or recurrent small bowel obstruction.^{1-6,16} In these studies, the success rate for laparoscopic adhesiolysis for acute small bowel obstruction has ranged from 46% to 87%.^{2-4,6}

In the present series, lysis of adhesions was successful in 82.4% of cases that used laparoscopy, a satisfactory result by comparison with other studies. Conversion to laparotomy was performed for intestinal perforation or the presence of dense adhesions, the latter being the most common cause of conversion to laparotomy.²⁻⁴ Adhesions between the small intestines and the abdominal wall were lysed with scissors and forceps close to the abdominal wall. Electrosurgical current was used only for hemostasis. Use of the Veres needle and blind insertion of the first trocar in patients with an acute small bowel obstruction and bowel distention are associated with an increased risk of bowel injury.²⁻⁴ Although the initial trocar was blindly inserted after the establishment of pneumoperitoneum with a Veres needle, there were no instances of bowel injury. It is our belief that it is safe to use the blind technique if the bowel is adequately decompressed before surgery. However, it is important to confirm the position of the needle using the syringe test and to monitor the intra-abdominal pressure during insertion of the first trocar.

Several groups of investigators have assessed clinical outcome after laparoscopic adhesiolysis.^{1,3} Francois et al.¹ reported that 32 of 50 patients (64%) treated by laparoscopic adhesiolysis for small bowel

obstruction or chronic abdominal pain were asymptomatic at a mean follow-up of 24 months. Strickland et al.³ studied 34 patients who underwent laparoscopic or open laparotomy for acute small bowel obstruction and found one recurrent small bowel obstruction requiring surgery in each group during a mean follow-up of 88 weeks. However, there have been no reports of laparoscopic adhesiolysis in which the follow-up period was more than 5 years. In the present study, the mean follow-up was 61.7 months. Although 14 patients (87.5%) remained asymptomatic, 2 had recurrent small bowel obstruction develop after laparoscopic adhesiolysis, 1 of whom required surgery.

Laparoscopic adhesiolysis is safe and effective for the management of recurrent small bowel obstruction. This operation is associated with a short hospitalization and a low frequency of recurrence of obstruction. Because of the risk of formation of adhesions after conventional laparotomy, it is our belief that laparoscopic adhesiolysis should be the first choice of operation for recurrent small bowel obstruction. However, conversion to laparotomy should be considered when it is difficult or dangerous to separate loops of bowel by using laparoscopic techniques.

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